Ecology Habits of *Equus hemionus* and *Gazella subgutturosa* in Kalamaili Ungulate Reserve in Autumn

Hu Defu (胡德夫)
College of Wildlife Resources, Northeast Forestry University, Harbin 150040, P. R. China
Zhang Daming (张大铭)
Department of Biology, Xinjiang University, Urumqi 830046
Lan Chunmei (兰春梅)
General Bureau of Forest Industry, Heilongjiang Province

Abstract The food habits of Wild ass (*Equus hemionus*)and Goitred gazelle (*Gazella subgutturosa*) in kalamaili Ungulate Reserve in autumn was described, based on the investigation conducted in 1992. Wild ass was much concentrated around water sources, and had more food resource than Goitred gezelle. The quagmires in the reserve were critical conditions as food and water bases for both species. In terms of present survey, it was estimated that 680 Wild ass and 8840 Goitred gazelle lived in this reserve.
Key words: *Equus hemionus, Gazella subgutturosa,* Reserve, Ecology Habits

Introduction

Kalamaili Ungulate Reserve (88° 30′- 90° 00′ E, 44° 46′ - 46° 00′ N), being founded in 1982 and covering 17,000 km^2, is situated in southeastern Dzungaria Basin in Xinjiang. Wild ass (*Equus hemionus*) and Goitred gazelle (*Gazella subgutturosa*) are ranked respectively as class I and II protected animals in China [1]. The reserve belongs to inland low hilly desert with extreme hot summer and cold winter. The vegetation feature presents scarce coverage, dwarf plants and low biomes. Dominant plants are *Haloxylon ammodendron*, *Reaumuria soogarica*, *Artemisia* spp., *Kalidium foliatum*, *Salsola* spp., *Certoides latens*, and *Anabasis salsa*. These harsh environmental factors and remote site have turned to advantage of avoiding from massively disturbance of people and domestic animals, and become critical aspects to support wild ungulates surviving in reserve. However, the living status about the ungulates in the reserve is little known. This research conducted in autumn in 1992, presented some knowledge of these ungulates and their environments.

Methods

During survey period, we went by car to run 6 transacts with 2 km width along southnorth directional reserve. The sampling area for all transacts reaches up to 8.2 % of the whole reserve. The survey routes were chosen as near as possible to water source, so as to observe animals and their suitable habitats. At the same time, faces samples of Wild ass and Goitred gazelle were collected at random from each transact. Totally, 45 faces samples for Wild ass and 52 for Goitred gazelle were collected. With plant histological microscope analysis, the species and proportion of plants containing in feces were identified and calculated to determine the food habits of Wild ungulates.

Results and Analysis

Number and distribution

From field observation, the density of two species in each transact was calculated and further transferred to estimate total number about this two species (Table 1). These numbers might seemingly be rough due to limited survey area. Of them, Wild ass number approximately approaches that of aerial survey in 1982 [2]. This result shows that this species has relatively stable population in size. But no data have been found to compare the numbers of Goitred gazelle from other studies. Many Wild ass were found around water source. The results from 4 survey groups indicated that the maximum individuals were 43, the minimum was 2, and the averaged were 14 in per group of Wild ass. Goitred gazelle almost occurred in the whole reserve, but were more in surrounding water place than in other area. 35 groups of this observed species had 40 for maximum, 2 individuals for minimum and 21 individuals for averaged in per group. In autumn, obviously, Wild ass distributed in clumped pattern, while Goitred gazelle distributed in uniform pattern in the reserve.

Food habits

In comparison with given slides of each plants, food

items were identified, 10 and 15 plants species were foraged by Wild ass and Goitred gazelle respectively (Table 2). By x^2 - test, these two animals in autumn are significant difference in food composition (D*f*=14, Σx^2 =359.91,P< 0.01).

Table 1. The number and densities of Wild ass and Goitred gazelle in the reserve

Number of transact	Area (km^2)	Density (individuals/ km^2)	
		Wild ass	Goitred gazelle
1	120	0	0.42
2	300	0.14	1.20
3	250	0	0.11
4	100	0.05	0.25
5	280	0.03	0.60
6	340	0	0.27
Mean value		0.04	0.52
Total number		680	8840

Table 2. Food spectrum of Wild ass and Goitred gazelle in autumn

Food items	Composition (%)		X^2
	Wild ass	Goitred gazelle	
Stipa gobica	84.80	43.36	125.78
Eragrostis minor	4.45	2.13	4.04
Phragramitis	0	0.24	1.78
Allium spp.	5.90	12.09	12.83
Salsola spp.	0.13	0.95	4.28
Artemisia spp.	0.13	1 90	1.12
Kochia scoparia	0.40	7.35	45.78
Reaumuria soogari	0.11	1.18	5.94
Suaeda corniculate	0	0.47	3.63
Ceratoides latens	3.80	25.83	113.19
Kalidium foliatum	0.13	2.60	16.51
Petrosimonia sibirica	0	0.24	1.78
Halogeton glomeratus	0	0.71	5.38
Nanophyton erinaceum	0	0.47	3.63
Ephedra spp.	0.13	0.47	1.24
Total	99.98	99.99	366.91

Data in Table 2 showed the food proportions of fine plants foraged by both species in their habitats. The proportion of *Stipa gobica* is up to 84.8 % and 43.3 %, that of *Allium sp.* for 5.9 % and 12 %, that of *Ceratoides latens* for 3.8 % and 25. 83 % respectively. That is to say that the two species have some overlaps in food composition among food resource. Apparently, the food spectrum for ruminant Goitred gazelle are wider than that for nonruminant Wild ass. The former has stronger adaptation to desert vegetation than the latter. Undoubtedly, the difference in preference food between these two species plays an important role in reducing interspecific food competition as to coexist stable. The plants preferred by both species are not dominant ones among desert vegetation in the reserve. This results showed that the food composition of Wild ass and Goitred gazelle was widely different in taking desert plants.

Food and water sources

The landscape in Kalamaili Ungulate Reserve is mainly composed of low hills from south to north and plain. Besides small spring during several mouths, of particular meaningful places are some patchy quagmires with central water pit in different depth of low land surrounded by hills. These quagmires formed with rainfall storage, also became critical water sources related to ungulates surviving in summer and autumn. During survey time, almost all of Wild ass was around the quagmires, few in other places. Although Goitred gazelle relatively scattered, it often concentrates on these quagmires, and encountering chance is low in the area far from quagmires. The vegetation around these water source, especially around quagmires, is predominated by Gramineae plants to form azonal steppelike patches. From food analysis, the major foods of these two ungulates are from these environments. Therefore, these places become both water source and food base for the two ungulates species. Therefore, they store up fat and build up bodies in these places to survive during long winter time period, meanwhile, these places are much important of taking nutritional needs for pregnant ones in autumn and winter.

The livestock enters the reserve because of lacking water spots in winter. With snow cover condition, the reserve and adjacent area become the wintering pasture for livestock to grazes in Altay Mountains in other seasons. Domestic animals are mainly composed of ruminants such as sheep, goat. Cattle and camel competed with Wild ungulates in food. By investigation above, we suggest that it is necessary to control the number of livestock entering the reserve in winter. And on the basis of vegetation investigation in autumn and winter, the proportion of Wild ass and Goitred gazelle should be controlled for sustainable utilizing the limited desert resources in long-term.

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